



1: J Lab Clin Med. 1996 Oct;128(4):417-22. [Links](#)

## **Is the ability of urinary tract pathogens to accumulate glycine betaine a factor in the virulence of pathogenic strains?**

Peddie BA, Chambers ST, Lever M.

Department of Nephrology, Christchurch Hospital, New Zealand.

The regulation of intracellular concentrations of organic solutes, including glycine betaine, is an important adaptive response to osmotic stress for *Escherichia coli*. The clinical significance of glycine betaine to uropathogens is not clear. Clinical isolates of *E. coli*, *Klebsiella pneumoniae*, *Enterobacter* species, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Staphylococcus aureus*, *S. saprophyticus*, and *Enterococcus faecalis* accumulated glycine betaine from hyperosmotic media. The addition of glycine betaine to hyperosmotic minimal medium accelerated the growth rates of all species tested except *P. mirabilis*. However, when clinical strains of *E. coli* were transferred from urine with low osmolality to hyperosmotic urine, there was no slowing of the growth rate. There was no difference in growth rates of *E. coli* isolates from acute pyelonephritis, cystitis, and asymptomatic bacteriuria nor from fecal isolates. The ability to accumulate osmolytes, although it may be a factor in the adaptation to hypertonic environments, was not related to virulence.

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